Mohammad Mahdi Rajabi

I am a researcher in the field of environmental engineering, currently working as an Assistant Professor in Tarbiat Modares University in Iran. My research is focused on 'uncertainty analyses, 'data assimilation', 'machine learning' and 'numerical modeling of flow and contaminant transport in the environment'.

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Current Position

Assistant Professor, Head of Environmental Engineering Department and Laboratory
Faculty of Civil and Environmental Engineering, Tarbiat Modares University
Tehran, Iran.

General Qualifications

Predictive Modeling, Exploratory Data Analysis, Uncertainty Quantification, Numerical Simulation, Computer Programming.

Technical Qualifications

- Programming in Python, MATLAB, R and Rust.

- Numerical modeling using MODFLOW, COMSOL Multi-physics, CE-QUAL-W2 and SWAT.

- SQL and NoSQL databases, including MongoDB, MySQL and IndexedDB.

- Machine learning platforms such as TensorFlow and Keras.

Educational Background

2007 B.Sc. in Civil Engineering
Sharif University of Technology, Tehran, Iran

2010 M.Sc. in Environmental Engineering
Sharif University of Technology, Tehran, Iran
M.Sc. Thesis Title: Three Dimensional Numerical Modeling of Freshwater Lens in Small Islands (Case Study of Kish Island)

2015 PhD in Civil Engineering
Sharif University of Technology, Tehran, Iran
PhD Thesis Title: Uncertainty Analysis and Inverse Modeling of Seawater Intrusion in Coastal Aquifers – Awarded as the Best PhD Thesis (Tavakoli Award) in 2015 by the Department of Civil Engineering, Sharif University of Technology, Tehran, Iran.

Journal Publications

1. Dodangeh, A., **Rajabi, M. M.**, Carrera, J., & Fahs, M. (2022). Joint identification of contaminant source characteristics and hydraulic conductivity in a tide-influenced coastal aquifer. Journal of Contaminant Hydrology, 103980.

2. **Rajabi, M. M.**, Javaran, M. R. H., Bah, A. O., Frey, G., Le Ber, F., Lehmann, F., & Fahs, M. (2022). Analyzing the efficiency and robustness of deep convolutional neural networks for

modeling natural convection in heterogeneous porous media. International Journal of Heat and Mass Transfer, 183, 122131.

3. **Rajabi, M. M.**, Chen, M., Bozorgpour, A., Al-Maktoumi, A., & Izady, A. (2021). Stochastic Techno-economic Analysis of CO2-circulated Geothermal Energy Production in a Closed Reservoir System. *Geothermics*, *96*, 102202.

4. Al-Maktoumi, A., **Rajabi, M. M.**, Zekri, S., Triki, C. (2021) A Probabilistic Multiperiod Simulation-Optimization Approach for Dynamic Coastal Aquifer Management. Accepted for publication in the Journal of Water Resources Management.

5. Chen, M., Al-Maktoumi, A., **Rajabi, M. M.**, Izady, A., Al-Mamari, H., & Cai, J. (2021). Evaluation of CO_2 sequestration and circulation in fault-bounded thin geothermal reservoirs in North Oman using response surface methods. *Journal of Hydrology*, 126411.

6. **Rajabi, M. M.**, Fahs, M., Panjehfouladgaran, A., Ataie-Ashtiani, B., Simmons, C. T., & Belfort, B. (2020). Uncertainty quantification and global sensitivity analysis of double-diffusive natural convection in a porous enclosure. International Journal of Heat and Mass Transfer, 162, 120291.

7. **Rajabi, M. M.**, Belfort, B., Lehmann, F., Weill, S., Ataie-Ashtiani, B., & Fahs, M. (2020). An improved Kalman filtering approach for the estimation of unsaturated flow parameters by assimilating photographic imaging data. Journal of Hydrology, 590, 125373.

8. Ataie-Ashtiani, B., **Rajabi, M. M**., & Simmons, C. T. (2020). Improving model-data interaction in hydrogeology: Insights from different disciplines. *JHyd*, *580*, 124275.

9. **Rajabi, M. M.** (2019). Review and comparison of two meta-model-based uncertainty propagation analysis methods in groundwater applications: polynomial chaos expansion and Gaussian process emulation. Stochastic Environmental Research and Risk Assessment, 1-25.

10. **Rajabi, M. M.**, Ataie-Ashtiani, B., & Simmons, C. T. (2018). Model-data interaction in groundwater studies: Review of methods, applications and future directions. *Journal of Hydrology*, *567*, 457-477.

11. **Rajabi, M. M.,** & Ketabchi, H. (2017). Uncertainty-based simulation-optimization using Gaussian process emulation: Application to coastal groundwater management. *Journal of Hydrology*, 555, 518-534.

12. **Rajabi, M. M.**, Ataie-Ashtiani (2016), Efficient Fuzzy Bayesian Inference Algorithms for Incorporating Expert Knowledge in Parameter Estimation, *Journal of Hydrology*, 536, 255-272.

13. **Rajabi, M. M.**, Ataie-Ashtiani, B., & Janssen, H. (2015). Efficiency enhancement of optimized Latin hypercube sampling strategies: Application to Monte Carlo uncertainty analysis and meta-modeling. *Advances in Water Resources*, *76*, 127-139.

14. **Rajabi, M. M.**, Ataie-Ashtiani, B., & Simmons, C. T. (2015). Polynomial chaos expansions for uncertainty propagation and moment independent sensitivity analysis of seawater intrusion simulations. *Journal of Hydrology*, 520, 101-122.

15. **Rajabi, M. M.**, & Ataie-Ashtiani, B. (2014). Sampling efficiency in Monte Carlo based uncertainty propagation strategies: application in seawater intrusion simulations. *Advances in Water Resources*, 67, 46-64.

16. Ataie-Ashtiani, B., Ketabchi, H., & **Rajabi, M. M.** (2013). Optimal management of a freshwater lens in a small island using surrogate models and evolutionary algorithms. *Journal of Hydrologic Engineering*, 19(2), 339-354.

17. Arhami, M., Kamali, N., & **Rajabi, M. M.** (2013). Predicting hourly air pollutant levels using artificial neural networks coupled with uncertainty analysis by Monte Carlo simulations. *Environmental Science and Pollution Research*, 20(7), 4777-4789.

18. Ataie-Ashtiani, B., **Rajabi, M. M.**, & Ketabchi, H. (2013). Inverse modelling for freshwater lens in small islands: Kish Island, Persian Gulf. *Hydrological Processes*, 27(19), 2759-2773.

Teaching

- 2009-2010: Groundwater (Undergraduate Course)
- 2010-2015: Hydraulics Laboratory (Undergraduate Course)
- 2016-present: Water Quality Management (Graduate Course)
- 2016-present: Modeling Pollutant Transport and Dispersion (Graduate Course)
- 2016-present: Soft Computing (Graduate Course)

Guest Editor

- Guest Editor for the special issue on "Improving model-data interaction in Hydrogeology: Insights from different disciplines", Journal of Hydrology (2018).

Technical Reviewer

- Journal of Hydrology
- Advances in Water Resources
- Hydrology and Earth System Sciences (HESS)
- Journal of Water Conservation Science and Engineering
- Iran-Water Resources Research Journal
- Journal of Hydraulics

Languages

- Persian: Mother Tongue Language
- English: Proficient (TOEFL ibt Score: Reading 30/30, Listening: 29/30, Speaking: 28/30, Writing: 24/30)